

First Lessons in Arithmetic.

"Do you know your letters?" is the question by which most people measure the attainments of a little child, but from experience gained in teaching a succession of eight little ones of my own, I should rather say, "Can you play at dominoes?" We were advised in the March number of this *Review* to give our first reading lesson when the child is five years old. This gives me the start by a whole year. Mine came "down to lessons" at three years and nine months, and I am sure that not only was the effort to sit still for a quarter of an hour good for them, but the "lessons" we did gave such clearness and accuracy to the little minds that they formed the foundation of accurate knowledge afterwards. They learnt to distinguish forms easier still than "Cock Robin." I have records of the very first lesson given to twins at this age. I took a small firm square table, and chairs with backs, just the right height to keep the little feet firmly on the floor. I prepared three small bright new Japanese bowls which they had not seen before, and some large ivory counters, delightful to handle. When they were seated, and full of proud expectation, I put in each bowl two counters, and when we had taken them out a few times, one more. The lesson consisted in taking them out over and over again, and placing them on the table in a pattern.

For *two* counters there is but one pattern, for *three* there are two patterns—a triangle and a row, and the row can be made three ways, upright, horizontal, and diagonal. Four is a very favourite number with children, because so many things have four corners, and four legs. One more placed in the middle of four makes five, and that again easily divides into the patterns of two and three; but I have recorded that it took a whole week to get to five. It is best to go very slowly, there is quite enough to do to fill many a happy half-hour before we get to

five. The patterns must be exact, not "muddled," the counters should be moved, not with the palm of the hand as my boy did at first, but with the tips of the fingers; all who try to teach little ones on modern lines know the training needed for the tips of the fingers, and especially for square boyish hands. Then came the charming discoveries that the window has four panes, the carriage four wheels, and baby's carriage three.

It seemed to me that the work I did was only to fix their attention on the fact that the counters formed patterns with a name, which name fitted on to the discoveries everywhere to be made in the world. "Why, the handles of the chest of drawers are in a pattern of eight." After we had mastered six we took out a box of dominoes; and then there was plenty of easy work to do in simply copying a domino with our counters, and executing the same form with precision. The counters made the dots, and the sticks which belonged to our stick-laying made a frame all round and a division in the middle. The more exact the copy, the more satisfied the child. We took a month to be able to recognise seven and eight. Seven is the hardest number of all. It requires but little imagination to see that to master all the numbers up to ten took a long time; and when we did get to ten we "stayed" there awhile, for the component parts of ten are all in all for further progress.

Long before any attempt to multiply or add is made I would make a child say absolutely perfectly "one and nine, two and eight, three and seven," &c., "*make ten*," and later on "one and nineteen, two and eighteen, make twenty." Now it is necessary to buy a box of "double dominoes," as they are called, that is one containing double nine. A good box may cost 6s. 6d., but the outlay is well worth while. The game admits of much skill for older children, but to begin with it is easy enough: it consists only in matching the end of one domino to another. By four and a-half years old our children could beat their father in the evening game, or they would gravely and steadily work out a game against one another, scarcely ever failing to pick out correctly from their own little wall of dominoes the one that "matched."

Now in all this you will say, perhaps, that there was no arithmetic; we could not write a row of figures, much less "draw a line and do a sum." We never talked of "adding" and "subtracting," nor of "plus and minus;" a number in our

baby minds was expressed by a pattern of dots, and by nothing else. Quite true. We took no trouble at all about those curly crooked forms, one like a sickle, and one like a loaf of bread,* till we began to notice that they were present in a large size two inches high, on the Shakspeare calendar, off which we tore one date every morning. We kept some of these loose sheets, and pasted them on cards, and after looking at them for a long time, we first learnt to trace them with one finger on a Japanese tray, full of fine sand, a quarter of an inch deep, and the dots we made which expressed the same number in the sand by the side.

But by that time we were well on in arithmetic, for while we worked away only with counters, as soon as we were sure of two we made another two, and we found out that two counters and two counters "pushed together" made four counters, and the pattern was four and only four; and we loved the pattern of nine, because it "parted" into threes both ways, and ten was quite easy, because it was just two patterns of five. Besides this we could turn our bowls over, and push any two numbers odd or even together under one bowl, and guess what was underneath; or we could take some more bowls, and part a big number up into even quantities in each bowl, and see if we had guessed right. Later on we could put out long rows of twos and threes, and fours and fives, and pass our fingers along them, calling them school-children or soldiers, and finding out by joining them together how many there were in a row. Thus we learnt the earlier parts of the multiplication table without ever drawling through "two twos are four."

Then we did this backwards. Some of our soldiers were cowards, and ran away. The counters were taken rapidly off the table, and we said how many were brave, till they were "all shot." After getting familiar with tens, we took up twelve, and then we could have a most delightful change. We made a shop, with real pennies and shillings and sixpences, and this was just as easy as dominoes, because we made our patterns on the table while we did our shopping, but it was an excellent change of work, because it was *real*. "We had the eggs for tea which we sold to mother, and twelve of them *did* cost a shilling." From this it was but a step to "fractions," halves and quarters of shillings, half-pennies and farthings, and from that to factors.

* "And one (ten) like a hoop and stick," suggested by the youngest child.

By the help of the black board we so arranged dots and lines that we learnt to know which were "rich" numbers, such as 12, 24, 36, and that 11, 13, 19 would not cut up at all. In all these calculations the counters were the foundation of our knowledge. We handled them about and felt them, and arranged them to our satisfaction. We made "quite sure," and then we *knew*.

The only book I know which has helped me in this sort of teaching is "The A B C of Arithmetic" by Sonnenschein and Nesbit (Whittaker & Co.). It has helped me, but I could never work from it; for in the second page the children are to learn the figures up to 5, both Arabic and Roman, and not only plus and minus, but \mp "is contained in," and further than that, new names are invented for units, tens, and hundreds, and a complicated apparatus is required. Finding that I could never remember the difference between Staves, Cubes, and Plates, and knowing that the children knew there was such a word as "ten" and "hundred," and that if they did not know "units" we could say "ones" till they did, I kept to my own way, and left these names alone. But the *principle* of the teaching is all in the book, and the story sums are very suggestive.

I believe that in many infant schools and kindergartens domino cards are used; but each child should be allowed his own counters—buttons or beans would do—for the child must arrive at abstract ideas of numbers through objects which he sees and handles.

Those who begin at once with figures on slates and multiplication tables agree, I suppose, with a mother who said to me, "When you tell a child a fact he believes you; the most beautiful thing in children is their faith; you must not destroy their faith!"

Go to an inspector's examination in any country school, and watch with sharp eyes under the desks, and see if the poor little strugglers in the first standard are not some of them doing their sums on their fingers. "Seven and five . . . eight, nine, ten, eleven, twelve." But if *before* they arrived at this method, the little fingers which are ever so handy at it, whether hung uselessly by their sides, or tucked behind their backs, or folded (I have *seen* a child do it with folded arms)—if these same fingers had been happy and busy at their desks handling counters, they would know that two patterns with "extra dots,"

that is, two uneven numbers *must* form up into an even number, and that that number must be twelve; because one taken off seven and put on to five makes two sixes.

The abacus *leads* a child to count, that is, to add by "ones." The beads are all in rows, and who can say which is eight or nine of o o o o o o o o o, and which is odd or even, except by colour, and colour is not arithmetic. I once saw a clever inspector so arrange a large abacus, that three rows of it made a *five form*, covering the other beads with a book—the most encouraging sight I ever saw for the future of infant schools; but the children had learnt their beads in *rows*, and could not understand him. He never even mentioned counters, however, and I don't suppose "My Lords" have ever heard of them.*

Dominoes belong to us mothers at present, and if we make the best we can of them I think we may so pave the way for the teachers into whose hands our children shall fall that they will bless us. We do not always earn their benedictions at present.

We have time to *play*, that is the beauty of our work. We need not hurry; if only we will begin early enough, and be content to go slowly, and leave our "results" for others to reap in "payments," if they can.

Our reward is enough for us if the little ones continue to look on learning as a delight and a joy, and drudgery and dulness are yet unknown.

M. L. HART DAVIS.



* "My Lords" and the inspectors have doubtless heard of buttons and beans, pencils and peas, for such uses, and are familiar with the idea of teaching children to work with concrete quantities before they are introduced to abstract numbers—so would they learnedly express it.

Journalism as a Career.

By JOHN DAWSON, *Author of "Practical Journalism," &c.*

We have progressed in many ways if not in all. We may not build so well as our ancestors, but we produce better newspapers, and the position of the producer—the journalist—has improved. Nothing, perhaps, has made such rapid advances during the last quarter of a century as journalism.

Parents, now, I fancy, have ceased, generally speaking, to hold up their hands in horror should a promising son declare his intention of adopting literary work as a profession. This was not always so. In our grandfathers' days it was very often considered that to become a writer was only one remove from becoming an inmate of the workhouse. Even so recently as my youth every one had not got rid of the idea (a relic of the Grub Street period) that writing for the Press gave you only a crust one day and nothing next. I vividly remember with what alarm my mother received the intimation (delivered with great enthusiasm on my part, of course) that I meant to be a journalist. She was more disturbed than when I said I was going to be a circus clown, and it indeed lowered her spirits more than when I declared I should be a sailor, which she considered dangerous but at least respectable. My mother (bless her memory!) had known only one journalist in the little country town where we resided, and him, unfortunate wretch, she had seen horsewhipped by a stalwart draper in the High Street for something he had written. Probably she pictured her son John undergoing sundry horsewhippings at the hands of infuriated shopkeepers who object—and very properly—to the liberty of the Press being abused. I have never been horsewhipped (perchance the pleasure is yet to come)—people have chosen rather to put me in prison for my writings—but I once